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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/016,869	12/14/2001	Richard John O'Connor	01-753	5992

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EXAMINER

BELENA, JOHN F

ART UNIT PAPER NUMBER

3746

DATE MAILED: 12/15/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/016,869

Applicant(s)

O'CONNOR, RICHARD JOHN

Examiner

John F. Belena, Ph.D.

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed 06/18/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-4, 6-10 and 12 is/are rejected.
- 7) ☒ Claim(s) 5, 11 and 13-16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Response to Amendment

1. This Office Action is in response to applicant's amendment filed on 06/18/03. As directed by the amendment **claim 1** was cancelled and **claims 2-14** were amended. **Claims 2-16** are pending in the application.

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12/15/03

2. The indicated allowability of **claims 7^{are}** ~~is~~[^] withdrawn in view of the reference(s) to (5,9076,949) to Falke et al. and (4,464,895) to Morrison et al. Rejections based on the cited reference(s) follow.

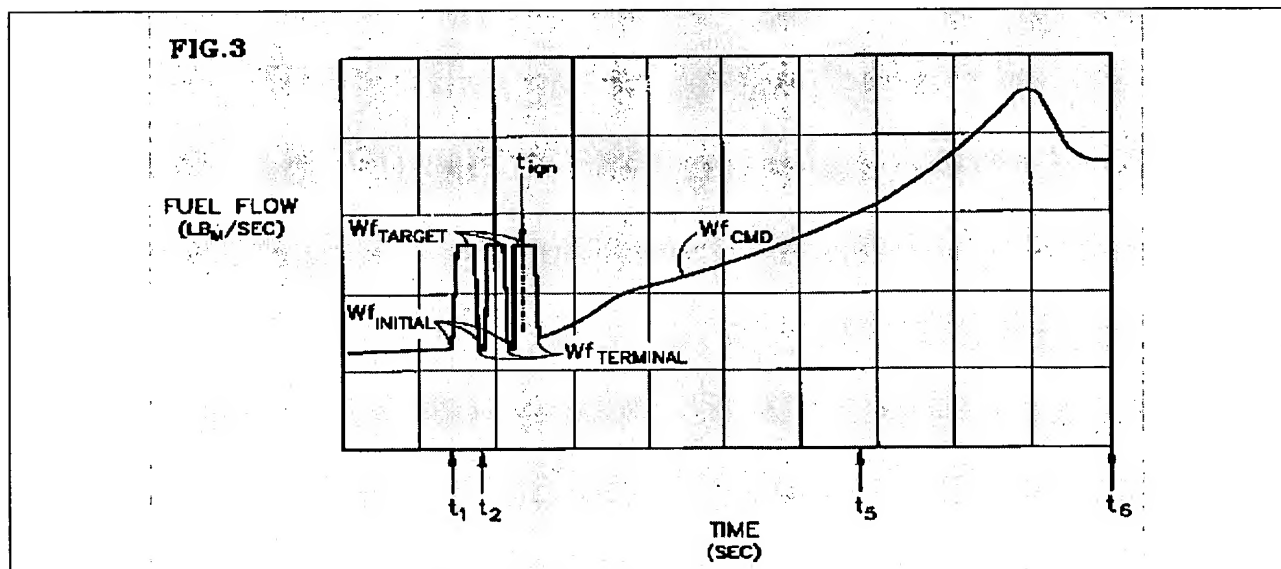
Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 7, 2, 6, 8, 9 & 10** are rejected under 35 U.S.C. 102(b) as being anticipated by (5,9076,949) to Falke et al.



Falke et al., Figure 3 as displayed above discloses according to applicant's **claim 7 & 8**, a method of engine starting in a gas turbine engine comprising: rotating the engine at a varying speed as a function of time {See col. 4 lines 19-21 - rotor is accelerated or increased in speed & col. 4 lines 34-39 - windmilling will vary the rotor speed in all possible speed modes} to provide an air flow into a combustor of the engine {Col. 4 line 20}; injecting fuel into the combustor at a varying rate {Col. 6 lines 7-18} until the engine is lighted-off {Fig. 3, t_{ign} } the varying rate being a function of time and represented by a curve {Fig. 3} having at least one high frequency {pulsing steps} with respect to a light-off time, representing instant changes of the rate for intersecting a light-off zone { t_{ign} } while reducing a quantity of fuel injected into the combustor ; and then continuously injecting fuel into the combustor to accelerate the engine to a self-sustaining operation

condition {Col. 4 lines 28 & 29}. According to applicant's **claim 2**, the curve {Fig. 3} comprises a low frequency {average flow -Not drawn} with respect to the light-off time, representing a change trend of the varying rate {All three steps have varying starting and ending values of W_f }. According to applicant's claim 6, the curve has an increasing trend (Increasing values of W_f as time gets larger) and comprises a step profile {Col. 6 line 9}. According to applicant's **claim 9**, there is an introduction of a predetermined first fuel flow level into the combustor {Fig. 3 fuel delivery as seen in curve up to time t_1 } prior to fuel injection at the varying rate {steps}. According to applicant's **claim 10**, selecting a minimum air speed {Windmilling during airstart} to begin the introduction of the predetermined first fuel flow level {Fig. 3 fuel delivery as seen in curve up to time t_1 } for starting the engine under a variety of altitude and temperature conditions {Col. 3 lines 18-21}. See

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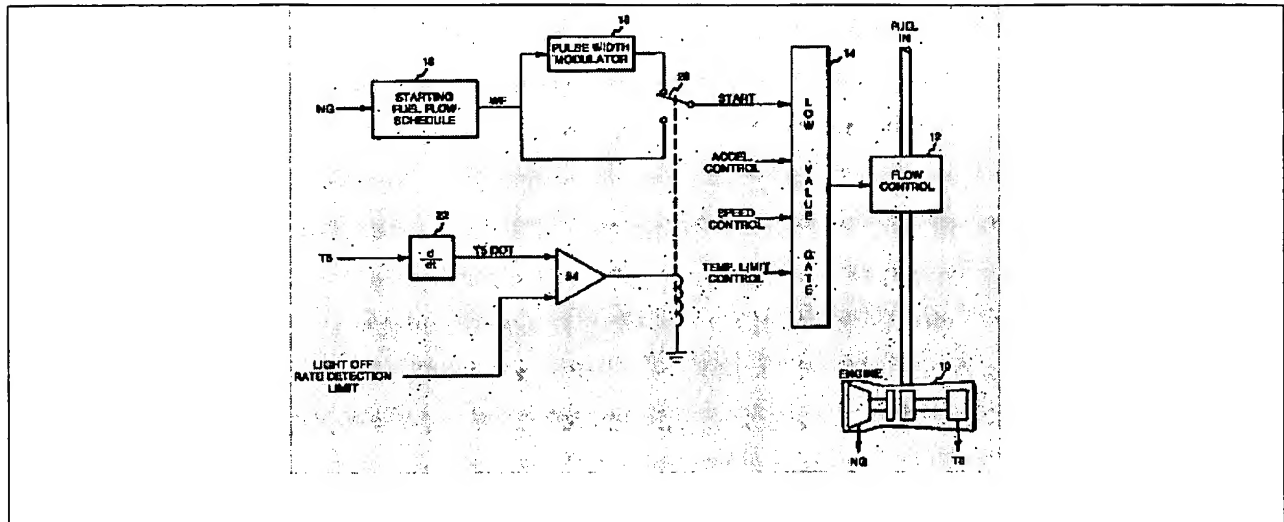
Falke et al., Figure 3, and respective portions, abstract, col. 3 lines 17-25, col. 4 lines 19-34, col. 6 lines 7-15, of the detailed description.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 7, 2, 3, 4, 8 & 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over (4,464,895) to Morrison et al. in view of (5,9076,949) to Falke et al.



Morrison et al., sole Figure, discloses according to applicant's **claim 7**, a method of engine starting in a gas turbine engine (10) comprising: rotating the engine to provide an air flow into a combustor of the engine; injecting fuel into the combustor at a varying rate {Col. 2 lines 4-15, Col. 3 lines 25-45} until the engine is lighted-off {Abstract} the varying rate being a function of time and {can be} represented by a curve having at least one high frequency {pulsing} with respect to a light-off time, representing instant changes of the rate for intersecting a light-off

zone {ignition} while reducing a quantity of fuel injected into the combustor {Col. 1 lines 65 & 66}; and then continuously injecting fuel into the combustor to accelerate the engine to a self-sustaining operation condition {Col. 2 lines 53 & 54}. According to applicant's **claims 2, 3 & 4**, at start the fuel delivery will be low {Col. 2 lines 38 & 39} hence rising as the fuel delivery is varied {Col. 3 lines 32-35} via fuel pulsing hence the fuel delivery curve would comprise a low frequency {average flow} with respect to the light-off time, representing a change trend {From low delivery at start and up} of the varying rate where the fuel delivery curve has an increasing trend and comprises an oscillatory profile {due to pulsing} with a series of spikes {due to pulsing}. According to applicant's **claim 12**, a temperature of an exhaust gas flow is sensed to determine if the light-off occurs {Col.4 lines 8-38}. See Morrison et al., sole Figure and respective portions, abstract, col. 1

lines 60-68, col. 2 lines 1-68, col. 3 lines 1-68, col. 4 lines 1-38, of the detailed description.

Morrison et al. does not disclose according to applicant's claims 7 & 8 the engine rotating at a varying or increasing speed.

Falke et al. discloses rotating the engine at a varying or increasing speed in a method of engine starting. See Falke et al. and respective portions, abstract, col. 4 lines 19-21 & lines 34-39 of the detailed description.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to take the engine of Morrison et al. and vary or increase the speed of the rotor at start up so as to ramp up the airflow into the combustor to terminate the start cycle as soon as possible.

****The claims were examined with the broadest reasonable interpretation of the claimed structural/functional subject matter. A proper and**

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acceptable response to this office action requires addressing all issues/objections/rejections invoked in this office action.**

Allowable Subject Matter

7. **Claims 5, 11 & 13-16** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

CONCLUSION

8. Any inquiry concerning this communication from the examiner should be directed to **John F. Belena, Ph.D.** whose **telephone number is (703) 305-3533**. The examiner can normally be reached on Monday through Thursday from 9:00 AM to 5:00 PM. The examiner can also be reached on alternate Fridays from

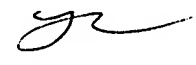
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9:00 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the **examiner's supervisor, Justine R. Yu**, can be reached on (703) 308-2675. The fax number for this Group Art Unit 3746 is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group Art Unit 3746 receptionist whose telephone number is (703) 308-0861.



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12/15/03

12/12/03

